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# Professor Adam Marian Dziewoński (1936-2016)

**OBITUARY**

Professor Adam Marian Dziewoński, outstanding seismologist and geophysicist, Professor of Harvard University, member of the Polish Academy of Sciences and the United States National Academy of Sciences, awarded of the Crafoord Prize in Geosciences and the William Bowie medal, passed away on 1 March 2016 in Cambridge, Massachusetts, USA.

Adam Marian Dziewoński was born on 15 November 1936 in Lwów. After completing his high school education in Wrocław, he enrolled at the Faculty of Mathematics and Physics, University of Warsaw. Still an undergraduate student, he went to Vietnam to conduct measurements of the Earth's magnetic field in the Cha-Pa Observatory, in the framework of the II International Geophysical Year (1958-1959). He graduated from the University of Warsaw, with major in geophysics, writing a master's thesis on daily magnetic activity variations in equatorial zone. In the years 1960-1965 he was employed at the Department (now Institute) of Geophysics, Polish Academy of Sciences, in Warsaw. He received his doctor's degree in the field of seismology from the Academy of Mining and Metallurgy in Cracow on the basis of the thesis: "The problems of multiple reflections in synthetic seismograms". After years, this Scientific Institution honored him with the title of "Doctor Honoris Causa".

In 1965 he moved to the United States, where he continued his scientific career, first at the Southwest Center for Advanced Studies, then at the University of Texas in Dallas, and since 1972 at Harvard University in Cambridge. The activity of Adam Dziewoński covered a wide range of topics in seismology, relating to the earthquake focal mechanisms and the Earth's in-

terior structure. His first works were about the structure of the upper mantle inferred on the basis of surface wave dispersion.

Adam Dziewoński was one of giants of science; his greatest achievements concerned: (1) studies of the Earth's free oscillations and inner core, (2) development of the Preliminary Reference Earth Model, PREM, (3) studies on earthquake mechanisms based on centroid moment tensor inversion, and (4) global seismic tomography. His accomplishments in these four areas are the milestones in seismology; each of them alone would suffice to call its author a giant.

In the epoch of "analog seismology", the digitization and then analysis of seismograms from the great Alaska earthquake of 1964 enabled him to identify and correct the modes of free oscillations of the Earth and consequently to demonstrate that the inner core is solid.

In 1981, Adam Dziewoński, jointly with Professor Don L. Anderson, developed the Earth's structure model, named the Preliminary Reference Earth Model, PREM, which has been and still is the basic reference for other models of the structure and geodynamic processes. After nearly 40 years from its publication, the PREM model continues to be widely used, with some 200 citations per year (making up a total of over 5000).

Adam Dziewoński is the author of a method for studying the earthquake mechanisms on the basis of seismic wave recordings (inversion of the centroid moment tensor). The Harvard Seismology Group that has been led by him is now publishing results of earthquake mechanism studies for several hundred greatest earthquakes every year.

Adam Dziewoński invented the global seismic tomography, which yields a three-dimensional model of the Earth's interior structure based on millions of measurements of seismic wave travel-times between the source and the seismic station. Taking advantage of the differences in seismic wave propagation velocities, it is possible to map the Earth's interior. For instance, it is possible to observe the geometry of cooler lithospheric plates submerging into warmer Earth's mantle, down to the boundary with the liquid outer core (layer D″). This is essential in the study of dynamic processes responsible for the drift of continents, earthquakes, recent tectonic movements, and volcanism.

Adam Dziewoński was very strongly involved in organizing modern seismological stations network, indispensable for obtaining the highest-quality observational materials, giving insight into the deep structure of the Earth. For many years, he has been Chairman of the Executive Committee of the Incorporated Research Institutions of Seismology (IRIS), a large consortium of universities and research institutes in the field of seismology and Earth interior research.

Recognizing the outstanding contribution of Adam Dziewoński to our understanding of the Earth's interior, the Royal Swedish Academy of Sciences honored him with the Crafoord Prize in 1998. The Crafoord Prize, funded in 1980, is awarded every year, on a rotating scheme, in one of the five disciplines that are not covered by the Nobel Prize: Mathematics, Astronomy, Geosciences, Biosciences, and Rheumatology. It was first granted in 1982 in Mathematics. The 1998 Crafoord Prize, in Geosciences, was awarded by Adam Dziewoński jointly with his close collaborator, Professor Don L. Anderson (California Institute of Technology, Pasadena, USA), for their fundamental contribution to the knowledge of the structure and processes in the Earth's interior. The Crafoord Prize is being granted by the same Committee as the Nobel Prize, and it is also presented by the King of Sweden.

Adam Dziewoński had been keeping close, friendly contact with the Polish geophysical community. He was member of Advisory Board of *Acta Geophysica*.

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